

## New taxa of wasp-waisted clearwing moths (Lepidoptera, Sesiidae, Similipepsini) from Vietnam\*

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**Abstract** A new genus, *Gasterostena* gen. nov., and two new species, viz. *Gasterostena vietnamica* sp. nov. and *G. ikedai* sp. nov. are described and figured from Vietnam.

**Key words** Lepidoptera, Sesiidae, Similipepsini, new genus, new species, Oriental Region, Vietnam, taxonomy.

### Introduction

In our publication concerning a revision of the type species of the genus *Similipepsis* Le Cerf (Gorbunov & Arita, 1995), we included in the tribe Similipepsini the following two genera: *Similipepsis* Le Cerf, 1911 (type species: *Similipepsis violaceus* Le Cerf, 1911) and *Milisipepsis* Gorbunov & Arita, 1995 (type species: *Similipepsis takizawai* Arita & Špatenka, 1989). Beside this, we used taxon *Vespaegeria* Strand, 1913 (type species: *Vespaegeria typica* Strand, 1913) as a synonym of the former genus. In this work we placed in the genus *Similipepsis* all known species of the tribe from the Afrotropical Region, but those from the Oriental Region and Eastern part of the Palaearctic were included in *Milisipepsis*, which was erected as a new genus. Such division is based not so much on principles of historical zoogeography, as might appear at first sight, as on a distinct morphological hiatus between the representatives of these two groups, especially in the conformation of the male genitalia (cf. for example figs 7a–e and figs 8a–e in Gorbunov & Arita, 1995).

Recently, A. Kallies and Y. Arita have described a new species of the tribe Similipepsini *Similipepsis helicellus* from Vietnam, because of “...the venation ( $R_1$  arising from about 2/3 of R-stem), the shape of the antennal apical segments (apical 12 segments without pectination) and the shape of the ventral process of the tegumen (rounded) the species can not be included in *Milisipepsis*.” (Kallies & Arita, 2001). It is absolutely correct that this taxon cannot be included into *Milisipepsis*. But also we cannot see great similarity between *Similipepsis helicellus* and the Afrotropical representatives of *Similipepsis*. Apart from that, we cannot believe that the tribe Similipepsini could consist of a single genus only. In witness of it, we describe one new genus with two new species herein. By the structure of the male antenna, hindwing venation, and by the conformation of the male genitalia, this new genus, *Gasterostena* gen. nov., is clearly distinguishable from all known genus-group taxa of the tribe.

Describing the new genus, we considerably reduce number of the tribal characters. Now only the following three signs precisely separate Similipepsini from other tribes of Tinthiinae:

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the wasp-waisted abdomen, forewing venation and basally open aedeagus in the male genitalia.

All specimens examined are kept in the following collections abbreviated in the text as follows:

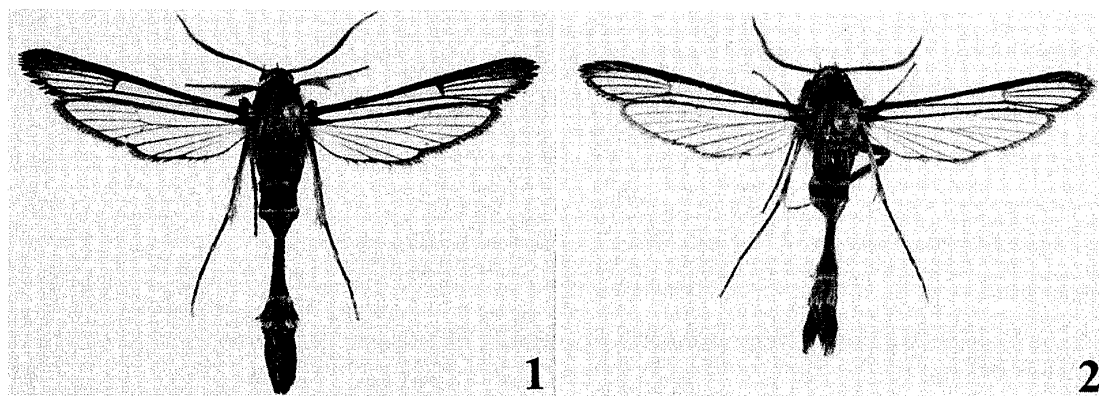
COGM—collection of O. G. Gorbunov, Moscow, Russia;

NSMT—National Science Museum, Tokyo, Japan.

***Gasterostena* gen. nov.**

Type species: *Gasterostena vietnamica* sp. nov.

**Description.** Medium-sized *Similipepsis*-like clearwing moths with alar expanse about 25–32 mm. Head with antenna filiform, shortly unipectinate in apical quarter, ciliate throughout in male; frons smooth-scaled; labial palpus with long scales on basal joint ventrally, turned-up, not extending vertex; proboscis long, well-developed, functional; occipital fringe with setaceous scales. Posteriorly both metepimeron and metameron without hair-like scales. Legs smooth-scaled; hind tibia with slightly elongated and protruding scales both medially and distally. Abdomen smooth-scaled; in male segment 4 distinctly narrowed posteriorly, segment 5 strongly depressed, segment 6 slightly broadened posteriorly; anal tuft well-developed. Forewing with transparent areas well-developed; discal spot narrow; veins  $R_1$  and  $R_2$  parallel; veins  $R_3$  and  $R_{4+5}$  shortly stalked; veins  $R_4$  and  $R_5$  stalked for about a third of their length; vein  $CuA_2$  undeveloped (Fig. 3). Hindwing transparent; discal spot undeveloped; vein  $M_2$  arising from about middle of cross-vein; distance between fork of veins  $CuA_1$  and  $CuA_2$  about 1.5 times longer than that between base of veins  $M_3$  cross-vein; vein  $CuP$  well sclerotized throughout; veins 1A and 2A well-developed; vein 3A extremely thin and short, not reaching edge of wing (Fig. 3). Male genitalia (Figs 4a–d, 5a–d) with tegumen-uncus complex relatively small; uncus triangular, membranous or well-sclerotized, sometimes with a long seta laterally; tuba analis with scaphium undeveloped, subscaphium large, well-sclerotized (Figs 4a, 5a); valva (Figs 4b, 5b) elongate-oval with long setae at dorsal margin on outer side and dense short setae in distal half on inner side; sacculus well-developed, covered with minute setae ventrally; saccus (Figs 4c, 5c) short and broad, rounded basally; vinculum short; aedeagus (Figs 4d, 5d) with coecum penis undeveloped, broadened and open basally, 1.5–2.0 times longer than length of valva; vesica with a large, distally furcate cornutus. Female genitalia unknown.



Figs 1–2. Moths of *Gasterostena* gen. nov. 1. *G. vietnamica* sp. nov. Holotype ♂. Alar expanse 31.4 mm (NTSM). 2. *G. ikedai* sp. nov. Holotype ♂. Alar expanse 25.5 mm (NTSM).

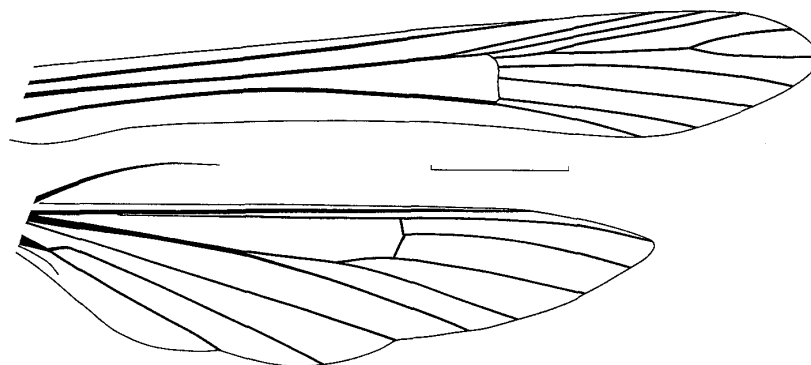


Fig. 3 Wing venation of *Gasterostena vietnamica* gen. et sp. nov. Scale bar: 2.0 mm.

**Diagnosis.** *Gasterostena* gen. nov. can be easily separated from *Milisipepsis* Gorbunov & Arita (type species: *Similipepsis takizawai* Arita & Špatenka, 1989) and *Similipepsis* Le Cerf, 1911 (type species: *Similipepsis violaceus* Le Cerf, 1911) by the structure of the male antenna (filiform, without pectination in these genera compared), hindwing venation (veins  $M_3$  arising from a point of lower angle of cell or slightly basally; veins 1A and 2A completely coincident in *Milisipepsis* and *Similipepsis*; cp. Fig. 3 with figs 5 and 6 in Gorbunov & Arita, 1995) and by the unique structure of the male genitalia (cp. Figs 4a–d and 5a–d with figs 7a–e and 8a–e in Gorbunov & Arita, 1995).

**Bionomics.** The larval biology is unknown. The moths are on the wing in May, July and August, possibly in two generations.

**Structure.** At present, we include in this new genus the following two species: *Gasterostena vietnamica* sp. nov. (type species) and *G. ikedai* sp. nov.

**Range.** Oriental Region: Vietnam.

**Etymology.** The name of this new genus is an anagram of habitually similar wasps of the genus *Stenogaster* (Hymenoptera, Stenogasteridae). Gender is feminine.

***Gasterostena vietnamica* sp. nov.** (Figs 1, 3, 4a–d)

**Description.** Male (holotype) (Fig. 1). Alar expanse 31.4 mm; body length 19.8 mm; forewing 14.6 mm; antenna 6.4 mm.

**Head:** antenna dorsally dark brown to black with purple-violet sheen, with yellow apical third, ventrally light brown; scapus yellow; frons dark grey-brown with greenish sheen, with yellow scales laterally; basal joint of labial palpus mixed with dark brown and yellow-orange scales, mid joint ventrally yellow to yellow-orange, dorsally dark grey-brown, apical joint mixed with black and yellow scales; vertex dark brown to black with green sheen; occipital fringe dorsally dark brown to black, laterally yellow-orange.

**Thorax:** patagia dark brown with violet-green sheen; tegula dark brown with bronze-purple sheen, with admixture of orange scales both anteriorly and posteriorly, with a small, elongated, yellow-orange spot at base of forewing; mesothorax dark brown with bronze-purple sheen; metathorax dark brown to black with bronze-purple sheen, with admixture of yellow-orange scales posterior-laterally and with a tuft of dark brown to black and orange hair-like scales laterally; thorax laterally grey-brown with bright bronze-purple sheen, with admixture of yellow scales; posteriorly metepimeron and metameron yellow to pale yellow

with golden sheen.

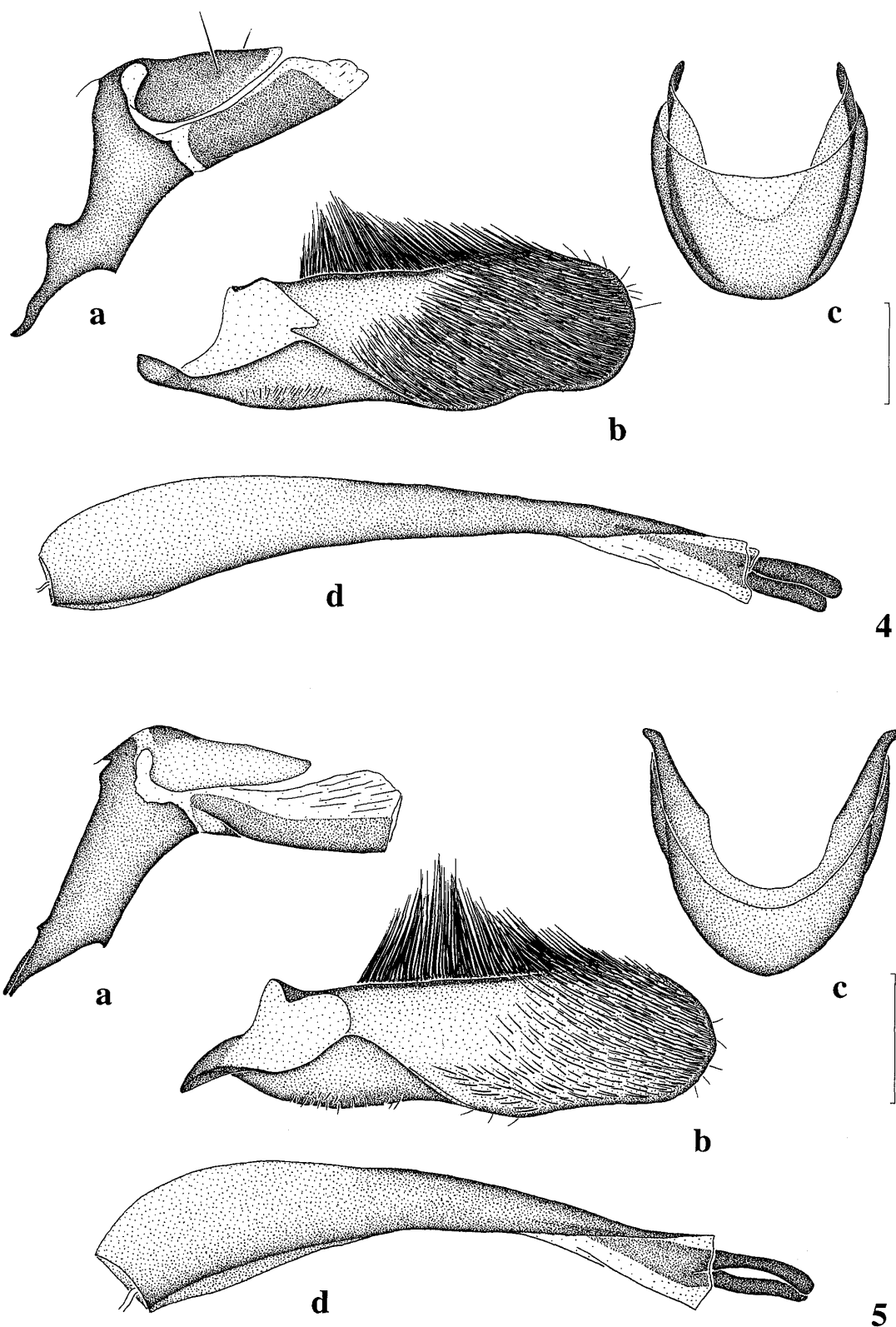
Legs: neck plate mixed with brown and yellow-orange scales; fore coxa yellow-orange with golden sheen, with admixture of dark brown scales with bronze-purple sheen exterior-posteriorly; fore femur yellow-orange with golden sheen, with admixture of individual grey-brown scales with bronze sheen; fore tibia dorsally dark brown to black with bronze-purple sheen in basal half and yellow-orange with golden sheen in distal half, ventrally dark yellow-orange with a few grey-brown scales with bronze-purple sheen; fore tarsus dorsally dark brown to black with purple-green sheen, with a small yellow-orange spot posteriorly on two basal tarsomeres, ventrally yellow-orange with golden sheen; mid coxa yellow-orange with golden sheen, with a few dark grey-brown scales with bronze-purple sheen; mid femur yellow-orange with golden sheen, with admixture of individual grey-brown scales with bronze-purple sheen both anteriorly and posterior-basally; mid tibia exterior-dorsally dark grey-brown with bronze-purple sheen, with a large yellow-orange spot with golden sheen both medially and posteriorly, interior-ventrally yellow-orange with golden sheen; spurs yellow-orange with golden sheen; mid tarsus exterior-dorsally dark grey-brown with bronze-purple sheen, with a small yellow-orange spot on two basal tarsomeres posteriorly, with a few yellow-orange scales on remaining tarsomeres, interior-ventrally yellow-orange with golden sheen; hind coxa yellow-orange with golden sheen, with a few dark grey-brown scales with bronze-purple sheen; hind femur yellow-orange with golden sheen throughout; hind tibia exterior-dorsally dark grey-brown with bronze-purple sheen in basal half, in distal half yellow-orange with golden sheen, with a narrow dark grey-brown spot with purple sheen posteriorly, interior-ventrally yellow-orange with golden sheen; spurs yellow-orange with golden sheen; four hind basal tarsomeres exterior-dorsally dark grey-brown with purple-green sheen, with a small yellow-orange spot posteriorly, hind tarsus interior-ventrally and apical tarsomere throughout yellow-orange with golden sheen.

Abdomen: dorsally dark brown to black with purple-blue sheen; tergites 1 and 2 densely mixed with yellow scales laterally; tergites 2-4 with a narrow yellow stripe posteriorly; tergite 5 with yellow scales posterior-laterally; tergites 6 and 7 with admixture of yellow scales posteriorly; ventrally yellow; sternites 1+2 and 3 with a narrow grey-brown stripe with greenish sheen posteriorly; sternite 6 with admixture of grey-brown scales with greenish sheen posteriorly; sternite 7 grey-brown scales with greenish sheen throughout; anal tuft dorsally dark brown with anthracite sheen, with a few yellow scales medially, laterally dark brown with purple sheen, with admixture of yellow scales.

Forewing: basally, costal and anal margins and CuA-stem dark brown with bronze sheen; discal spot narrow, triangular, dark brown with green-purple sheen, with admixture of a few yellow-orange scales; veins distally of discal spot dark brown with greenish sheen; apical area only on tip of wing, brown with green-bronze sheen, with admixture of yellow-orange scales; transparent areas well-developed; external transparent area divided into four cells; cilia brown with bronze-purple sheen.

Hindwing: transparent; veins and outer margin dark brown with bronze-purple sheen; discal spot undeveloped; outer margin narrow, about thrice as narrow as cilia; cilia brown with bronze-purple sheen.

Male genitalia (paratype, genital preparation Nos GA-147 and 1831 YA) (Figs 4a-d). Tegumen-uncus complex relatively small; uncus triangular, well-sclerotized, with a long seta laterally; tuba analis with scaphium undeveloped, subscaphium large, well-sclerotized (Fig. 4a); valva (Fig. 4b) elongate-oval with long setae at dorsal margin on outer side and dense



Figs 4–5. Male genitalia of *Gasterostena* gen. nov. 4. *G. vietnamica* sp. nov., paratype (genital preparation Nos GA-147 and 1831 YA). a. Tegumen-uncus complex. b. Valva. c. Saccus. d. Aedeagus. Scale bar: 0.5 mm. 5. *G. ikedai* sp. nov. paratype (genital preparation Nos GA-198 and 1832 YA). a. Tegumen-uncus complex. b. Valva. c. Saccus. d. Aedeagus. Scale bar: 0.5 mm.

short setae in distal half on inner side; sacculus well-developed, covered with minute setae ventrally; saccus (Fig. 4c) short and broad, rounded basally; vinculum short; aedeagus (Fig. 4d) broad, long, about twice as long as length of valva; vesica with a large, distally furcate cornutus.

Female. Unknown.

Individual variability. The specimens of the type series are slightly variable in individual size: alar expanse 30.0–31.6 mm; body length 18.0–20.0 mm; forewing 13.5–14.8 mm; antenna 6.0–6.7 mm. Besides this, they are quite inconstant in number of yellow-orange scales on the thorax, legs and forewing and yellow scales on two basal tergites of the abdomen.

Differential diagnosis. First of all, *G. vietnamica* sp. nov. is somewhat larger than *G. ikedai* sp. nov. (alar expanse about 25–27 mm in *G. ikedai* sp. nov.). This new species can be distinguished from the second new species of the genus by the coloration of the head (antenna brown to light brown with admixture of yellow scales dorsally in distal half; frons broadly pale yellow laterally; occipital fringe yellow in *G. ikedai* sp. nov.), thorax laterally (yellow with golden sheen, with admixture of individual grey-brown scales with bronze sheen in the species compared), abdomen (tergites 2, 3 6 and 7 with a narrow yellow stripe posteriorly; tergites 4 and 5 with admixture of yellow scales posterior-laterally; ventrally sternites 1+2 and 3 yellow with a narrow light brown stripe posteriorly; sternite 4 yellow anteriorly and silvery-white posteriorly; sternite 5 silvery-white with a few yellow scales posteriorly; sternites 6 and 7 mixed with yellow and light orange scales in *G. ikedai*), by somewhat broader external transparent area of the forewing (*cf.* Fig. 1 with Fig. 2) and some details of the male genitalia, especially by the shape and structure of the uncus, saccus and aedeagus (*cp.* Figs 4a–d and Figs 5a–d).

Bionomics. The host plant and larval bionomics are unknown. The moths were collected in July. Holo- and paratypes were collected with the use of artificial sex pheromone lures.

Habitat. Roadsides of tropical forest at an altitude of about 1,000 m.

Distribution. Known from the type-locality in Vietnam.

Material examined. 1 ♂ (holotype) (Fig. 1), Vietnam, Thu Thien Hue Prov., Bach Ma, ca 1,000 m, 27. VII. 2001, Y. Arita leg. (NSMT); 2 ♂ (paratypes), same locality and date, Y. Arita leg. (NSMT); 1 ♂ (paratype), same locality, 25. VII. 2001, Y. Arita leg. (genital preparation Nos GA-147 and 1831 YA) (NSMT); 1 ♂ (paratype), same locality and date, Y. Arita leg. (COGM).

Etymology. This new species is named after Vietnam, where it was collected.

***Gasterostena ikedai* sp. nov.** (Figs 2, 5a–d)

Description. Male (holotype) (Fig. 2). Alar expanse 25.5 mm; body length 14.4 mm; forewing 11.5 mm; antenna 4.3 mm.

Head: antenna brown to light brown with admixture of yellow scales dorsally in distal half; scapus pale yellow; frons grey-brown with light greenish sheen, broadly pale yellow laterally; labial palpus mixed with yellow and light brown scales; vertex brown with light greenish sheen; occipital fringe yellow.

Thorax: patagia light brown to brown with purple sheen, laterally yellow; tegula dark

brown with greenish sheen, densely covered with light brown scales, with admixture of yellow to yellow-orange scales both anteriorly and posteriorly, with a small, elongated, yellow-orange spot at base of forewing; mesothorax dark brown with bronze sheen, covered with light brown scales, with admixture of yellow scales posteriorly; metathorax yellow-orange with a dark brown spot medially and with a tuft of yellow-orange and light brown hair-like scales laterally; thorax laterally yellow with golden sheen, with admixture of individual grey-brown scales with bronze sheen; posteriorly metepimeron and metameron yellow with golden sheen.

Legs: neck plate yellow to yellow-orange; fore coxa yellow with golden sheen; fore femur externally yellow with golden sheen, internally yellow with golden sheen, with admixture of individual light brown scales with bronze sheen; fore tibia yellow to yellow-orange with golden sheen, with a small light brown spot dorso-basally; fore tarsus yellow with golden sheen, with a few light brown scales dorsally; mid coxa yellow with golden sheen; mid femur externally light brown with bronze sheen, narrowly yellow posteriorly, internally yellow with golden sheen; mid tibia yellow with golden sheen, with a large sparse dark brown spot with bronze-purple sheen both dorso-basally and posterior-dorsally; spurs yellow with golden sheen; mid tarsus exterior-dorsally light brown with bronze sheen, with a small yellow spot posteriorly on each tarsomere, interior-ventrally yellow with golden sheen; hind coxa yellow with golden sheen; hind femur yellow with golden sheen, with a few light brown scales anteriorly; hind tibia exterior-dorsally brown with bronze-purple sheen in basal half, in distal half yellow with golden sheen, with a narrow dark brown spot with purple sheen posteriorly, interior-ventrally yellow with golden sheen; spurs yellow with golden sheen; hind tarsus exterior-dorsally light brown with bronze sheen, with a small yellow spot posteriorly on each tarsomere, interior-ventrally yellow with golden sheen.

Abdomen: dorsally brown to dark brown with bronze sheen; tergites 1 and 2 densely covered with yellow-orange scales laterally; tergites 2, 3 6 and 7 with a narrow yellow stripe posteriorly; tergites 4 and 5 with admixture of yellow scales posterior-laterally; ventrally sternites 1+2 and 3 yellow with a narrow light brown stripe posteriorly; sternite 4 yellow anteriorly and silvery-white posteriorly; sternite 5 silvery-white with a few yellow scales posteriorly; sternites 6 and 7 mixed with yellow and light orange scales; anal tuft mixed with brown and light brown scales.

Forewing: basally brown with a few yellow-orange scales; costal and anal margins and CuA-stem brown with dark bronze sheen; discal spot narrow, straight, yellow-orange; veins distally of discal spot brown to dark brown with greenish sheen; apical area only on tip of wing, brown with bronze sheen, with admixture of yellow-orange scales; transparent areas well-developed; external transparent area divided into four cells; cilia brown with bronze sheen.

Hindwing: transparent; veins and outer margin brown with bronze-purple sheen; discal spot undeveloped; outer margin narrow, about thrice as narrow as cilia; cilia brown with bronze sheen.

Male genitalia (paratype, genital preparation Nos GA-198 and 1832 YA) (Figs 5a–d). Tegumen-uncus complex relatively small; uncus triangular, membranous; tuba analis with scaphium undeveloped, subscaphium large, well-sclerotized (Fig. 5a); valva (Fig. 5b) elongate-oval with long setae at dorsal margin on outer side and dense short setae in distal half on inner side; sacculus well-developed, covered with minute setae ventrally; saccus (Fig. 5c) short and broad, rounded basally; vinculum short; aedeagus (Fig. 5d) broad, long, about

1.5 times as long as length of valva; vesica with a large, distally furcate cornutus.

Female. Unknown.

Individual variability. The new species varies slightly in individual size: alar expanse 25.0–27.2 mm; body length 13.2–15.8 mm; forewing 11.0–12.5 mm; antenna 4.1–4.5 mm. Also they are somewhat inconstant in number of yellow to yellow-orange scales on the tegula, abdomen and tip of the forewing.

Differential diagnosis. This new species is somewhat smaller than *G. vietnamica* sp. nov. (alar expanse about 30–31 mm in the species compared). Besides that, *G. ikedai* sp. nov. differs from *G. vietnamica* sp. nov. by coloration of different parts of the body and by the conformation of the male genitalia (*cp.* corresponding descriptions and illustrations of these two new species and “Differential diagnosis” for *G. vietnamica* above).

Bionomics. The host plant and larval bionomics are unknown. The moths were collected in May and August. Holo- and paratypes were collected with the use of artificial sex pheromone lures.

Habitat. Borders of tropical forests and forest roads at an altitude of about 850 m.

Distribution. Known from the type-locality in Vietnam.

Material examined. 1 ♂ (holotype) (Fig. 2), Vietnam, Lam Dong Prov., Bao Loc, Dambri, ca 850 m, 6. VIII. 2001, Y. Arita leg. (NSMT); 2 ♂ (paratypes), same locality, 1–5. V. 2000, ca 850 m, M. Ikeda leg. (NSMT); 1 ♂ (paratype), same locality, 2. V. 2000, K. Fukuzumi leg. (NSMT); 1 ♂ (paratype), same locality, 3. V. 2000, K. Fukuzumi leg. (COGM); 1 ♂ (paratype), same locality, 2. VIII. 2001, Y. Arita leg. (genital preparation Nos GA-198 and 1832 YA) (NSMT); 1 ♂ (paratype), same locality, 3. VIII. 2001, Y. Arita leg. (genital preparation Nos GA-295 and 1833 YA) (NSMT); 1 ♂ (paratype), same locality, 5. VIII. 2001, Y. Arita leg. (genital preparation Nos GA-296 and 1834 YA) (NSMT); 3 ♂ (paratypes), same locality, 30. V. 2002, Y. Arita leg. (NSMT).

Etymology. This new species is dedicated to our friend Mr Masumi Ikeda (Tokyo, Japan), who is very fond of Sesiidae and who collected a part of the type series of the species.

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## 摘 要

ベトナム産のハチの様に腰の細いスカシバガ (スカシバガ科, Similipepsini) の2新種 (有田豊・Oleg G. Gorbunov)

ベトナムでスカシバガの調査中に, 合成性フェロモンルアーに飛来したハチの様に腰の細いスカシバガ2種類を採集した. 調査の結果それらは新属新種であることが明らかになったので記載した.

*Gasterostena* gen. nov.

この新属は, やはり腰の細い *Similipepsis* 属に外見は似ているが, 前後翅の翅脈, 雄のゲニタリアなどが異なる.

1. *Gasterostena vietnamica* sp. nov. (Figs 1, 3, 4a-b)

この属のタイプ種で, ベトナム中部の Thu Thien Hue Prov., Back Ma 国立公園の標高約 1,000 m 程のところで合成性フェロモンルアーに飛来した. これよりも標高の高いところでも低いところでも合成性フェロモンルアーには飛来しなかった.

2. *Gasterostena ikedai* sp. nov. (Figs 2, 5a-b)

前種よりやや小型で黄色のこの種は, ベトナム南部の Lam Dong Prov., Bao Loc, Dambri の標高約 850 m のところで前種同様合成性フェロモンルアーに飛来した.

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